

Emergency Action Plan (EAP)
For
Lake Creek Dam (L-24)
Osborne Creek Dam (O-15)
Woodrat Knob Dam (W-43)

Located in
Jackson County

Prepared For
B Bar K Cascade Ranch
February 3, 2017

With Support from
The Oregon Water Resources Department Dam Safety Program

EAP Organization

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Emergency Notification Messages

Urgent – dam failure - flooding is imminent or in progress

Call 9-1-1

Message: I am reporting an emergency at (Lake Creek, Osborne Creek, or Woodrat Knob Dam) on the B Bar K Cascade Ranch located off Milepost 12.5 on OR-140 in Jackson County, Oregon. This is **name and position** with **organization**. This is an urgent emergency, the dam is failing and a dam breach flood will occur. People are in danger and need to evacuate. Please implement the emergency action plan and make emergency contacts immediately. I am at **location** and can be reached at **phone number** after you have made emergency notifications.

Stay on the phone with the 9-1-1 operator until you both agree necessary information has been exchanged and the emergency response effectively initiated.

Potential dam failure situation is rapidly developing

Call 9-1-1

Message: I am reporting a potential emergency at (Lake Creek, Osborne Creek, or Woodrat Knob Dam) on the B Bar K Cascade Ranch located off Milepost 12.5 on OR-140 in Jackson County, Oregon. This is **name and position** with **organization**. At this time it is a potential dam failure emergency. Please inform Jackson County Emergency Management, and make other emergency contacts as necessary to prepare for possible evacuations. I am at **location** and can be reached at **phone number**. We are taking emergency actions to save the dam, and will contact the State Engineer and our engineer for technical advice on preventing dam failure. Please contact local emergency management and others as described in the Emergency Action Plan for this dam.

For an unusual condition, notify the Water Resources Department dam safety program and a consulting engineer as needed. Do not call 9-1-1 unless the situation worsens or more information at the site confirms a potential failure or failure in progress. Contacts are on Page 6 of this document

Dam Information and Directions

Lake Creek Dam: Height: 77 feet Latitude: 42.3756 Longitude: -122.624594

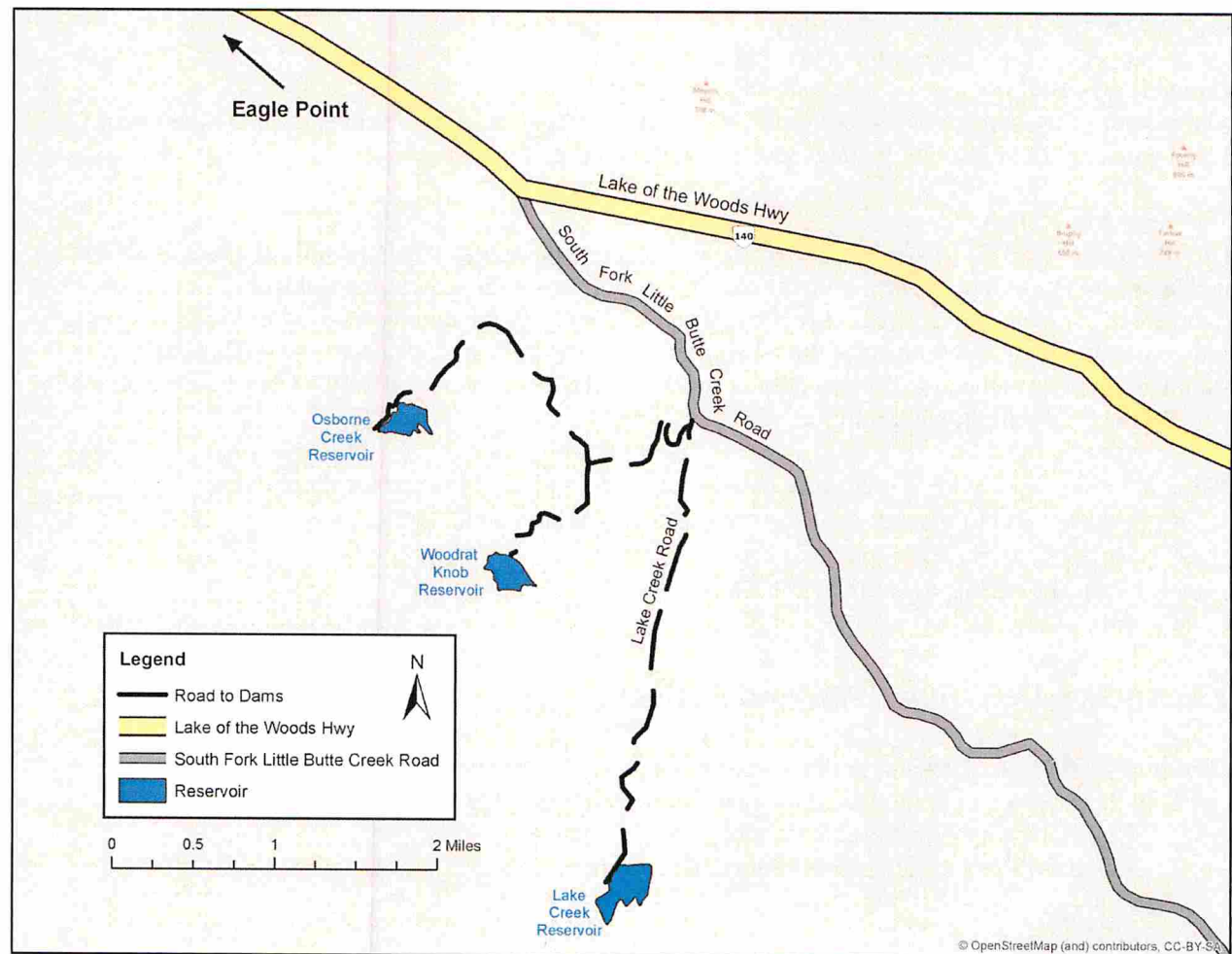
Osborne Dam ; Height: 60 feet Latitude: 42.4156 Longitude: -122.654121

Woodrat Knob Dam Height: 90 feet Latitude: 42.4019 Longitude: -122.641113

Directions to dams: The dams are on the B Bar K Cascade Ranch, located off Milepost 12.5 on OR-140 in Jackson County, Oregon.

Potential Impacted Area: Dam failures may inundate lower Lake Creek downstream along Little Butte Creek, including a significant part of Eagle Point

Map of the Dams



Existing conditions at these dams

The corrugated metal pipe low level conduits on all three dams have extensive deterioration. There is a strong possibility that if the valves on any of these pipes are fully opened, leakage of water into the embankment through holes in the pipes will occur. Leakage into the embankment will lead to internal erosion of embankment material. All of these dams were designed as homogenous earthfill dams. As a result, there is no internal protection to prevent seepage through the embankment so internal erosion can become an issue at any time.

Other issues specific to each dam are listed below.

Lake Creek Dam

In June of 1964, about 9 months after completion, about 31 gpm of seepage was observed at the right abutment. This was apparently due to a spring in the area which was not observed during construction, or was altered due to the reservoir. Measured seepage at the dam toe and right abutment has ranged from 10 to 30 gpm and 0 to 15 gpm, respectively

Osborne Creek Dam

The newest of these three dams, Osborne Creek Dam, has two minor issues in addition to the major issues noted above: poor vegetation maintenance and cattle eroding the slopes.

Woodrat Knob Dam

On May 1, 1961, a 250-foot-section of the downstream embankment began to slide at a rate of about 2 inches per hour. An emergency spillway was cut to help lower the reservoir quickly and a complete failure was avoided. Rehabilitation was completed in 1962 and the dam was raised in 1967. No new settlement has been observed since the rehabilitation. Bubbling water has been observed on the stabilization berm, related to non-functional toe drains. There is a new spillway on this dam capable of passing the Probable Maximum Flood.

Possible failure modes are listed below in order of likelihood of occurrence at these dams:

- Leakage due to internal dam erosion, especially related to the outlet pipes.
- Landslide of the dam embankments
- Overtopping due to spillway blockage
- Other Damage

Emergency Determinations and Actions

Problem Detection: Unusual or emergency events may be detected by:

1. Observations at or near the dam by the dam owner or other nearby observers.
2. Unusual events like extreme flooding and earthquakes.
3. Rapid flow changes below the dam that are unrelated to operations.

Emergency Severity is classified into one of the following (in order of increasing severity):

- 1. Unusual Condition**
- 2. Potential Dam Failure**
- 3. Dam failure occurring URGENT**

As soon as an emergency event is detected, immediately classify the Emergency Severity using the information on the next ___ pages. Monitor dam for changing conditions, and take all actions to save the dam if potential failure situation exists.

Unusual Condition

An unusual condition is a non-emergency that warrants inspection and monitoring for changes. For unusual conditions, the B Bar K Cascade Ranch should consult with their engineer and the State Engineer as needed to determine the appropriate Emergency Severity, if any.

Evidence

Leakage

- A new seep in the dam, with clear water and no observed increase in flow
- Any increase flow through the outlet pipes that is unrelated to valve operation.

Landslides and embankment damage

- An earthquake that causes materials to fall off of shelves in buildings close to the dams
- New open cracks in the dam with no seepage
- Small, shallow landslide or slump on either dam face, extending less than 1/3 of the way into the dam crest.

High Reservoir

- The water level in the reservoir is within 2.0 feet of dam crest.
- Spillway capacity is reduced by logs or other large debris, and rain or snowmelt may occur before debris can be removed.
-

Action

Inspect the dam and reservoir. Report the observed conditions to your Engineer and the OWRD State Engineer. Take pictures of the unusual conditions and send them to the owners Engineer and the State Engineer. Record all contacts that were made and all information, observations, and actions. Note the time of changing conditions. Document the situation with photographs and video if possible.

Potential Dam Failure

Evidence

Leakage

- Any leak in the dam with muddy water with leakage flow stable or increasing very slowly. This flow from this leak is not enough to make it unsafe to walk through the leaking water.
- Cracks through the dam have leakage. Water is clear and flow is not increasing.
- Leakage from the outlet pipe that is rapidly increasing and muddy.
- A boil (bubbling water) at the toe of the dam.

Landslides and embankment damage

- A deep landslide on the embankment or abutments that does not extend to the reservoir level.
- A new and developing sinkhole on the dam that is not related to animal burrows.

High Reservoir

- The reservoir is flowing over the top of dam at low depth and velocity, with no erosion of the dam.
- Any other condition that could lead to an uncontrolled release of the reservoir

Action

This situation may eventually lead to dam failure and severe flooding downstream. **Call 9-1-1 and inform the dispatcher that there is a potential dam failure using Message 2 on the second page of this EAP.** The ranch and or their engineer should closely monitor the condition of the dam and periodically report the status of the situation to the Jackson County Emergency Manager and to the OWRD dam safety engineer. If the dam condition worsens and failure becomes imminent, the Jackson County Emergency Manager must be notified immediately of the change in the emergency level to “Urgent” and to evacuate the people at risk.

After notifications, take all reasonable actions to prevent dam failure, as described on PAGE 6.

Dam failure occurring - URGENT

Conditions

Leakage

- A large leak in the dam. This flow from this leak makes it unsafe to walk through the leaking water.
- Rapidly increasing muddy leakage through cracks from landslide or any other damage.

Landslides and embankment damage

- Deep landslide extending into the upstream slope and to water level in the reservoir.
- Any other condition that is resulting in rapid unexplained lowering or uncontrolled release of the reservoir
- Any breach observed with uncontrolled water flowing from the reservoir.

High Reservoir

- Water is flowing over the top of the dam and eroding through the dam.

Action

For an imminent failure condition the priority is to notify 9-1-1 to save lives. **Call 9-1-1 and inform the dispatcher that there is a dam failure in progress using the Message 1 on the second page of this EAP.** Protect people on and immediately below the dam. After persons in the vicinity are in safe places, determine if the rate of dam failure can be slowed by dumping material and opening valves, or constructing a breach off of the actual dam. Actions at the dam under an imminent failure condition should be to protect persons on site, delay the flood if possible, and inform emergency managers on status of flooding at the dam.

Essential Emergency Contacts

Organization	Name	Title	Contact
Jackson County Emergency Management		Emergency Manager	541-774-6790 24-hour phone: 9-1-1
National Weather Service Medford Office		Lead Duty Forecaster	541-773-1067
Sheriff's Office	Corey Falls	Sheriff	541-774-6800 24-hour phone: 9-1-1
Oregon State Police Southern Command Center Dispatch		Duty Dispatcher	541-776-6111
ODOT District 8 – White City		Duty Dispatcher	541-774-6299
B Bar K Cascade Ranch	Dan Schleigh	Ranch Manager	541-538-9507
Oregon Emergency Response System (OERS)		Duty Officer	800-452-0311
Wetstone Engineering	Matthew Dusenbury	Dam Owner's Engineer	541-664-9344
Oregon Water Resources Department	Keith Mills	State Engineer	Phone (503) 986-0840 Cell: (541) 706-0849
Oregon Water Resources Department		Medford Office	541-774-6880

Saving the Dam OR Slowing the Failure

For Internal Erosion

Open outlet(s) to lower the reservoir level as rapidly as possible to a level that stops or decreases the seepage to a non-erosive velocity. If the outlet is damaged, blocked, or of limited capacity, initiate pumping and or siphoning. Continue lowering the water level until the seepage stops. Cover the seepage exit area(s) with several feet of sand/gravel to hold fine-grained embankment or foundation materials in place. Alternatively, construct sandbag or other types of ring dikes around seepage exit areas to retain a pool of water, providing backpressure and reducing the erosive nature of the seepage.

For landslide or major deformation

Open the outlet pipes, and work to bring pumps and or siphons to the dam. Observe cracks and measure drops and offset if the slide is not moving. Stay well above the slide or out of the area if this slide is moving. Construct an emergency spillway off of the embankment.

For water flowing over the crest

Place fill dirt, gravel and or sandbags as available along the low areas of the top of the dam to reduce the likelihood of overtopping and to safely direct more water through the spillway. Clear the spillway with whatever equipment is available and reasonably safe.

Other Damage

Immediately conduct a general overall visual inspection of the dam. Full open the low level conduit if there is leakage that could cause the dam to fail. Consider siphoning or pumping water from the reservoir.

Equipment and Materials

Equipment/Material	Name	Phone	Address
Pumps	United Rental – Pump Solutions	503-405-1197	4621 NW Saint Helens Rd Portland, OR 97210
Concrete Supplies	Knife River Materials	541-779-6304	3959 Hamrick Rd Central Point, OR 97502

Termination

Whenever the EAP has been activated and a dam failure emergency declared, the local Emergency Manager will determine when the emergency is over based on actual conditions. The local Emergency Manager will relay this decision to the dam owner, other emergency responders, and OERS to inform them the emergency has been terminated.

Prior to termination of a dam failure event that has not caused actual dam failure, the State Engineer will make every effort to inspect the dam or require the inspection of the dam to determine whether any damage has occurred that could potentially result in loss of life, injury, or property damage. If it is determined conditions do not pose a threat to people or property, the local Emergency Manager will be advised to terminate EAP operations as described above.

Unusual conditions are not emergencies. Unusual conditions end after an engineer determines that the unusual conditions pose no dam safety risk, and either conditions have improved or returned to normal.

Inundation Maps

EAP upkeep

The owner should review and update the EAP as needed. Copies of the revised EAP are distributed to all who received copies of the original EAP. Copies may be in a secure electronic format.

Emergency Action Plans need to be revised as conditions at the dams or contact information changes. All contact phone numbers should be checked by dialing them. This should occur on an annual basis.

Revision Number	Date	Revisions Made	By Whom

Emergency Response Exercise

Once every two years, the owner should perform an emergency response exercise which is a periodic test of the EAP. This periodic test can include, but is not limited to the following.

The emergency response exercise should consist of a meeting, including a tabletop exercise, conducted at the dam owner. Attendance should include all key personnel, at least one representative of the local law enforcement agency, and others with key responsibilities listed in the EAP. At the discretion of the dam owner, other organizations that may be involved with an unusual or emergency event at the dam are encouraged to participate. Before the tabletop exercise begins, meeting participants should visit the dam during the periodic test to familiarize themselves with the dam site.

The tabletop exercise will begin with the facilitator presenting a scenario of an unusual or emergency event at the dam. The scenario will be developed prior to the exercise. Once the scenario has been presented, the participants will discuss the responses and actions that they

would take to address and resolve the scenario. The narrator will control the discussion, ensuring realistic responses and developing the scenario throughout the exercise.

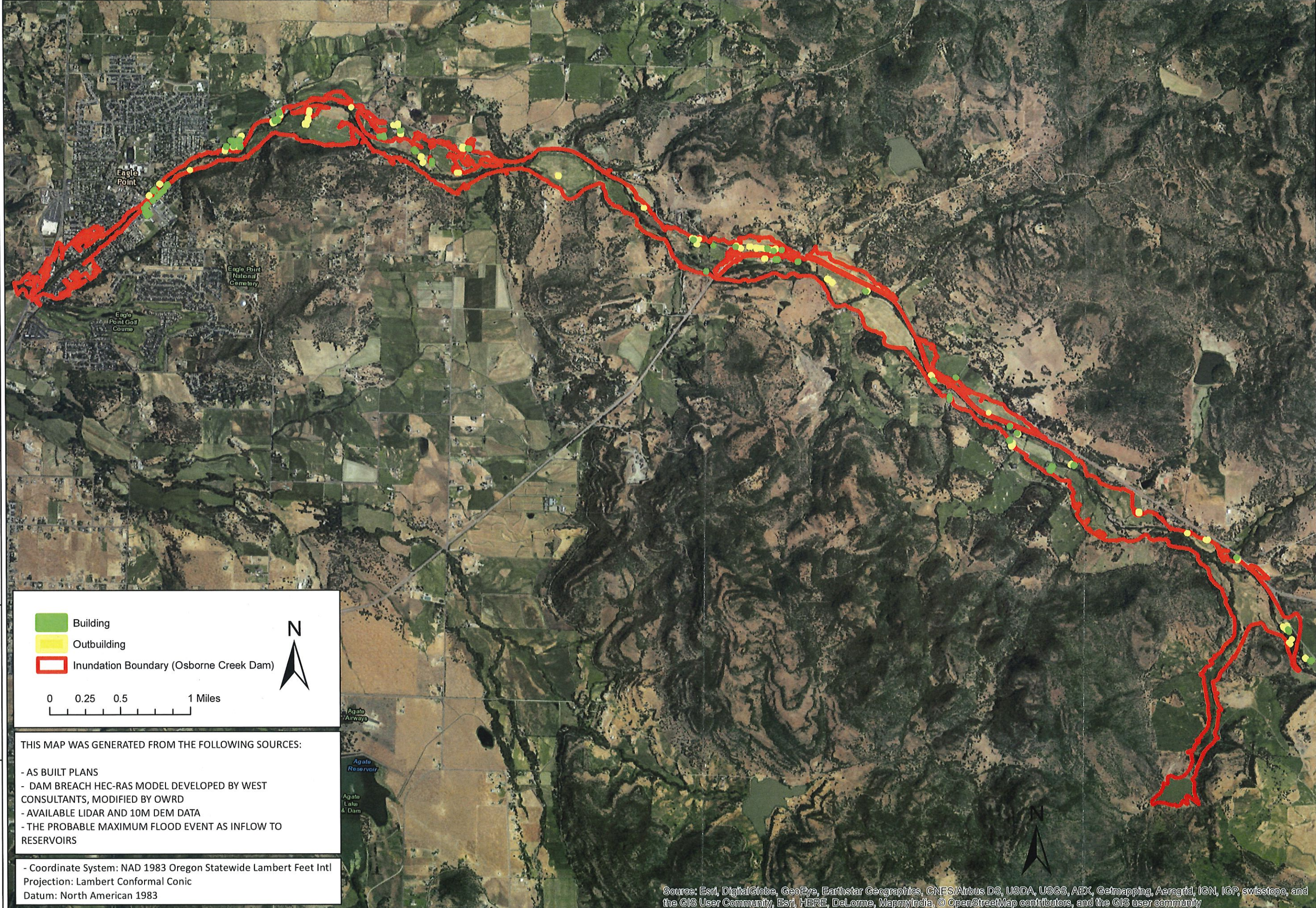
After the tabletop exercise, the EAP will be reviewed and discussed. Mutual aid agreements and other emergency procedures can be discussed. The dam owner should prepare a written summary of the periodic test and revise the EAP, as necessary.

Use and limitations of this Document

Intended first for the dam owner, to communicate unusual conditions and emergency conditions. Inundation maps are provided for the emergency managers and first responders.

This is a very general document. It is essential Obtain expert services and equipment and supplies quickly. It is the owner's responsibility for upkeep of this document, and to maintain communication with the local emergency managers.

The OWRD dam safety program conducts infrequent safety inspections of these facilities, and will not be able to detect any rapidly developing situation. OWRD will provide technical input in an actual emergency as time allows.



Building

Outbuilding

Inundation Boundary (Osborne Creek Dam)

00.250.51 Miles

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THIS MAP WAS GENERATED FROM THE FOLLOWING SOURCES:

- AS BUILT PLANS

- DAM BREACH HEC-RAS MODEL DEVELOPED BY WEST CONSULTANTS, MODIFIED BY OWRD

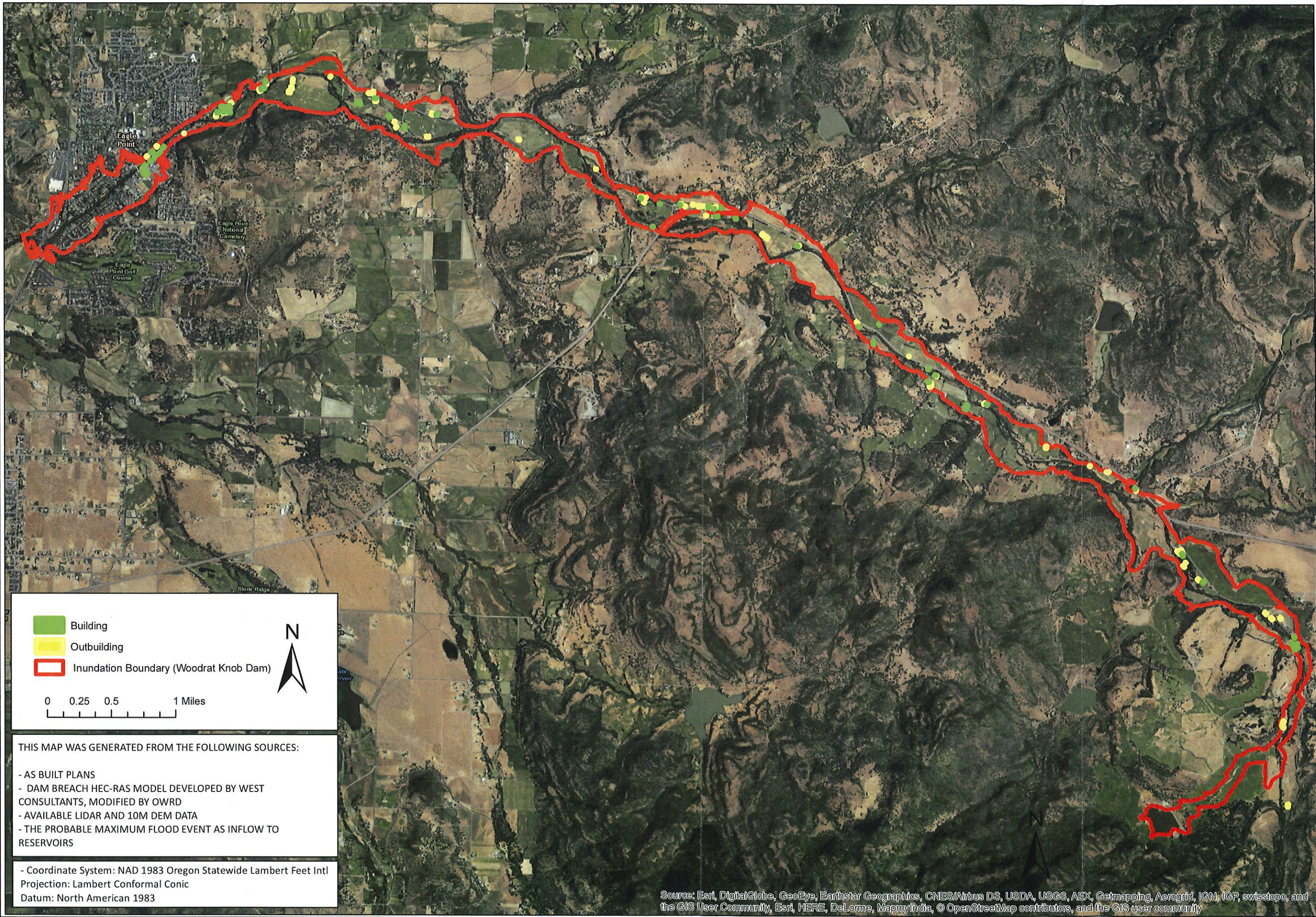
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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community, Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community

SHEET	DRAWING STATUS: FINAL	JACKSON COUNTY OSBORNE CREEK DAM DAM BREACH INUNDATION MAP	OREGON	OREGON WATER RESOURCES DEPARTMENT DAM SAFETY 725 SUMMER ST. SUITE A NE SALEM, OR 97301	DESIGNED BY																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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Outbuilding

Inundation Boundary (Woodrat Knob Dam)

00.250.51 Miles

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JACKSON COUNTY		OREGON		DESIGNED BY WEST CONSULTANTS															
DRAWING STATUS: FINAL		WOODRAT KNOB DAM DAM BREACH INUNDATION MAP		OREGON WATER RESOURCES DEPARTMENT DAM SAFETY															
				725 SUMMER ST. SUITE A NE SALEM, OR 97301															
SHEET				Submitted by:		Date: 2/7/2017		Revision		Date				Description		By			